DOCUMENT RESUME

ED 091 574 CE 001 346

TITLE	Managing Highway Maintenance: Instructor's Manual for Management by Objectives Review, Unit 11, All Levels.
INSTITUTION	Federal Highway Administration (DOT), Washington, D.C. Offices of Research and Development.
PUB DATE	Jan 73
NOTE	17p.; For related documents, see CE 001 339-345
EDRS PRICE	MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS	Budgets; Civil Engineering; *Group Discussion; *Leaders Guides; Leadership Training; *Maintenance; *Management Development; Manuals; *Objectives; *Road Construction; Standards
IDENTIFIERS	*Highway Maintenance

ABSTRACT

Part of the series "Managing Highway Maintenance," the unit is designed for the training group leader and contains selected highlights and suggested discussion questions from six units of training: maintenance activities, work units, and classifying work; maintenance feature inventories; how to conduct a maintenance feature inventory; standards for maintenance work; work programs and budgets; maintenance management--by objectives. (EA)

MANAGING HIGHWAY MAINTENANCE

INSTRUCTOR'S MANUAL FOR MANAGEMENT BY OBJECTIVES REVIEW

Management by Objectives Series

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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UNIT 11

ALL LEVELS

FEDERAL HIGHWAY ADMINISTRATION
Offices of Research and Development
January 1973

This book is part of the series "Managing Highway Maintenance," prepared for the Implementation Division, Office of Development, Federal Highway Administration, under contract FH-11-7600. The series as a whole is described in the *Training Guide and Catalog* volume.

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Implementation Division
Offices of Research and
Development

Washington, D.C.
January 1973

INTRODUCTION

This is the Management By Objectives Review. It is intended to be loosely structured group discussions of the subject matter presented in six units of training:

+ Maintenance Activities, Work Units and Classifying Work;
+ Maintenance Feature Inventories;
+ How to Conduct a Maintenance Feature Inventory;
+ Standards for Maintenance Work;
+ Work Programs and Budgets; and
+ Maintenance Management -- By Objectives.

This manual is designed for the training group leader. It contains selected highlights of each training unit and suggested questions for discussion.

The questions in this unit should be supplemented by other questions based on certification test results of the units listed above.

To prepare for and lead the discussions:

1. Study the units of training listed above, and the highlights and questions in this manual.
2. Organize separate discussion groups, based on the units taken by discussion participants. (Usually this will result in a group discussion for levels 1 and 2 and another discussion for level 3.)
3. Request discussion participants to review the training they have taken -- and bring to the discussion session any questions or comments about that training.
4. Review the group discussion and certification test materials in the Instructor's Guide.

TRAINING OBJECTIVES

Upon completion of this Review, group discussion participants should be able to:

- Restate the management by objectives concept -- as presented in applicable units of training in MANAGING HIGHWAY MAINTENANCE.
- Identify the steps being taken to implement elements of a systematic approach to maintenance management.
- With appropriate management actions, put into practice, the training related to work programs and maintenance standards.

HIGHLIGHTS OF
"MAINTENANCE ACTIVITIES, WORK UNITS AND CLASSIFYING WORK"

UNIT SUMMARY

The way maintenance is managed depends on the kinds and amounts of work being done. For some purposes, it's okay to say that maintenance is patching, sealing and some painting. But to plan and control work effectively, it has to be described clearly. This unit explains how maintenance work should be described, measured and classified.

An important part of a systems approach to maintenance management consists of work activities, work units and activity classifications:

+ Specific descriptions of work developed by administrators, engineers and supervisors who know maintenance;

+ Activity definitions -- based on the kinds of procedures being used, the results expected and the following six requirements:

  - They should describe a specific type of work.
  - They should give some idea of the work involved.
  - They should say when or why the work should be done.
  - They should help schedule, report and control work.
  - A unit of work should be assigned to each activity.
  - The description and work unit should be easily understood.

+ Work units that adequately represent amounts of work -- in a practical manner; and

+ Classifications that help manage maintenance.

QUESTIONS FOR DISCUSSION

1. What considerations determine the number of activities that need to be described for a particular maintenance department?

2. How can work procedures help define an activity?

3. We have said that activity descriptions that are too specific make scheduling impossible. Why is this true?

4. What are the criteria for assigning a work unit to a particular activity?

5. What are the tasks that need to be undertaken to develop useful descriptions and work units?

HIGHLIGHTS OF
"MAINTENANCE FEATURE INVENTORIES"

UNIT SUMMARY

This unit of training describes the work that has to be done to manage the data collection for a maintenance feature inventory.

There are several tasks that must be performed during each of the three stages of the inventory process:

+ Planning

  - Review inventory instructions and forms.
  - Calculate resource requirements.
  - Check on availability of manpower and equipment.

+ Organizing

  - Select and train inventory teams.
  - Determine routing patterns.
  - Set up procedures for summarizing the inventory.

+ Directing and Controlling

  - Spot-check inventory worksheets and vehicle odometers.
  - Summarize the worksheets.

QUESTIONS FOR DISCUSSION

1. What is the main purpose of maintenance feature inventories?

2. Why is training in maintenance feature inventories considered necessary?

3. What tasks are required to manage the data collection process for maintenance feature inventories?

HIGHLIGHTS OF
"HOW TO CONDUCT A MAINTENANCE FEATURE INVENTORY"

UNIT SUMMARY

The subject matter of this unit of training includes:

+ The purpose of a feature inventory;
+ What features are to be inventoried:
  - counted features,
  - measured features;
+ Procedures for conducting the inventory; and
+ Directions for completing inventory worksheets.

QUESTIONS FOR DISCUSSION

1. What is the main purpose of maintenance feature inventories?
2. How are maintenance feature inventories conducted?

NOTE: If necessary, the group discussion leader should refer to specific inventory directions -- in Unit 7, Levels 1 and 2.

HIGHLIGHTS OF "STANDARDS FOR MAINTENANCE WORK"

UNIT SUMMARY

"Standards for Maintenance Work" explains why standards are needed and describes, in detail, different kinds of standards. It also illustrates ways in which standards are developed and used. Training for levels 2 and 3 includes methods of communicating standards to subordinate supervisors and how to enforce those standards. Level 1 training emphasizes the practical use of standards and how they should be interpreted.

+ Standards are models to be followed or goals to be achieved. They are useful management tools because they promote a uniform level of maintenance, and facilitate planning and control.

+ Three kinds of standards are essential: quality standards, quantity standards and performance standards.

  - Quality standards are guidelines indicating under what circumstances work should be done.
  - Quantity standards are estimates of how much work is necessary to satisfy quality standards.
  - Performance standards are guidelines for doing the work and include the kinds and amounts of resources required, the procedure to be followed and an estimate of daily accomplishment.

+ Maintenance standards identify an operation, give a brief description of its purpose, and contain all the parts of a performance standard.

+ Maintenance standards can be used as:

  - Guidelines for how work should be done.
  - Planning and scheduling aids.
  - Guides for field inspection.
  - Training aids.
  - Work reporting aids.
  - Bases for work control comparisons.

The following are selected highlights of Level 1 training on using and interpreting standards:

+ Performance standards should be followed. When an activity is not standardized, the foreman and his supervisor should set objectives in terms of expected results.

+ There are day-to-day decisions which must be made when using and interpreting standards. Some of the decisions are best made by the foreman.

QUESTIONS FOR DISCUSSION

1. What is the purpose of quality, quantity and performance standards?

2. How do the standards described in the training compare with those we are currently using?

3. Do you agree with the statement, "Standards in any management system promote a uniform level of maintenance"? Why or why not?

4. What are the criteria that should be considered when establishing standards?

5. What are the basic principles of performance standards?

6. A personal approach to communicating standards is usually considered best. Why?

NOTE: The following selected questions should be directed to those supervisors who have taken Level 1 training.

7. What are the basic sections of a maintenance standard?

8. What could be a typical condition under which a performance standard can be bent? (Give an example.)

9. What is meant by "reading between the lines" on a maintenance standard?

HIGHLIGHTS OF
"WORK PROGRAMS AND BUDGETS"

UNIT SUMMARY

What is a maintenance work program? How is it developed and what purpose does it serve? "Developing Work Programs" answers these and other questions. It also describes some of the ways in which work programs are communicated to field supervisors and how the work load can be distributed through a work scheduling calendar.

"Budget Preparation" describes the essential steps in developing a maintenance budget based on the work to be done -- a "performance budget."

+ A work program is an estimate of work quantities.

+ A work program also authorizes work to be done.

+ There are several ways of developing a work program. But most of the methods incorporate the following work.

  - Maintenance activities are identified, described and measured;
  - An inventory of the road system is taken;
  - Decisions are made about how well the roads should be maintained; and
  - Other decisions are made about the quantities of work needed to reach given levels of maintenance.

+ A maintenance budget is an estimate of the cost of maintaining the roads for a year. There are many ways of estimating this cost, but probably the most reliable way is by analyzing and applying known costs to the items on the work program. A budget which is based directly on the work program is a performance budget.

- When the budget is cut, the work program must somehow be made less expensive. Usually the Department tries to keep the labor force constant.

- Equipment or material costs can be reduced by adjusting some activities up and others down, cutting those activities which might have high materials or equipment costs and increasing those activities which are mainly labor.

QUESTIONS FOR DISCUSSION

1. What is the purpose of a work program?
2. What are the tasks involved in one method of calculating a work program? (Level 3 only.)
3. Generally speaking, how is a work program developed?
4. Why is it necessary to compare the completed work program with available resources?
5. Why is it sometimes desirable to classify activities?
6. What is the purpose of a work scheduling calendar?

7. How is a budget related to the expected work load?

8. How are quality and quantity standards involved in preparing a budget?

9. What happens to the work program when the budget is cut?

HIGHLIGHTS OF
"MAINTENANCE MANAGEMENT -- BY OBJECTIVES"

UNIT SUMMARY

What is "management by objectives"? How does it work and what steps are needed to use the management-by-objectives concept? This unit of training answers all of these questions.

+ Management by objectives is the process of setting specific, measurable objectives -- and then working toward those objectives. It's deciding what the results of work should be -- and then managing in ways that ensure objectives are reached.

+ The concept of management by objectives is fully compatible with any systematic approach to maintenance management.

  - Activities are identified, described and measured;
  - The road system is inventoried;
  - Quality standards are developed to indicate the conditions under which work should be done;
  - Quantity standards and other values are applied to road system features -- and the result is a work program;
  - Resource requirements are calculated and efforts are made to level the work load;
  - And a budget is developed to support the work program.

+ Resource requirements must be calculated to ensure that supervisors have sufficient resources to accomplish the work program.

+ Activity descriptions, work programs, scheduling calendars and standards and the management by objectives concept must be communicated to field supervisors. The necessary communication can be facilitated by manuals, training and specific instructions from the boss.

+ Finally, work reporting systems must be used to complete the flow of information -- to provide a means by which managers can judge the success of their efforts to reach Department objectives.

QUESTIONS FOR DISCUSSION

1. What do we mean by "management by objectives"?

2. How does this concept differ from traditional maintenance objectives?

3. What is the purpose of traditional maintenance objectives and how can they be used?

4. Why must traditional maintenance objectives be translated into objectives which are specific and measurable?

5. Generally speaking, what are the steps required to develop and use management by objectives -- on a day-to-day basis?

6. Specifically, what are the elements of a management system which make up the management by objectives process?

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